SAM L21

AT14973: Wearable Demo Reference Design

USER GUIDE

Preface

The Wearable Demo (Ordering code: **ATULPC-DEMO**) Reference Design evaluation kit is a hardware platform to address the wearable and IOT markets.

The Wearable Demo Reference Design incorporates Atmel® SAM L21 microcontroller and ATBTLC1000 fully certified module with sensors to demonstrate a complete solution needed for the IOT.

Supported by the Atmel Studio integrated development platform, the kit provides easy access to the features that can be custom integrated in a design which will significantly reduce the time-to-market.

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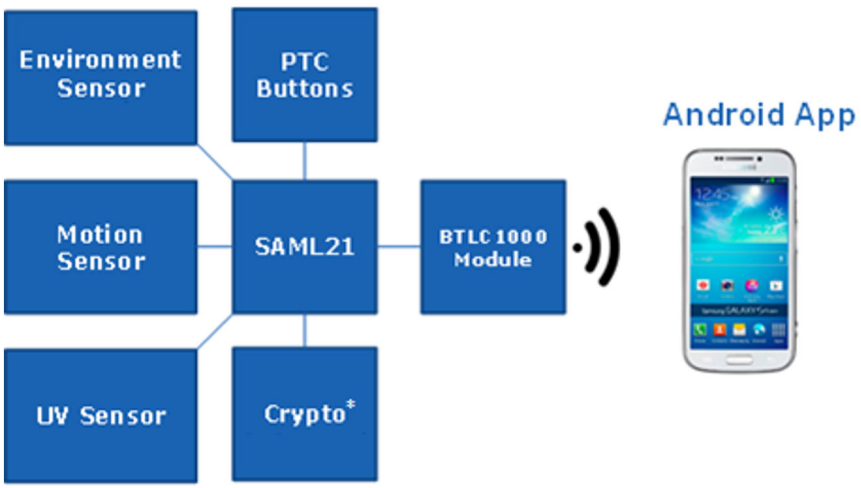
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1. Introduction

This document helps the user to understand the underlying technical details and the steps to operate SAM L21 Wearable Demo.

1.1. Features and Overview

Figure 1-1. Functional Block Diagram



Note: * Crypto is an optional feature in the current design

Figure 1-2. Wearable Demo Kit



1.2. Kit Overview

Figure 1-3. Top Side

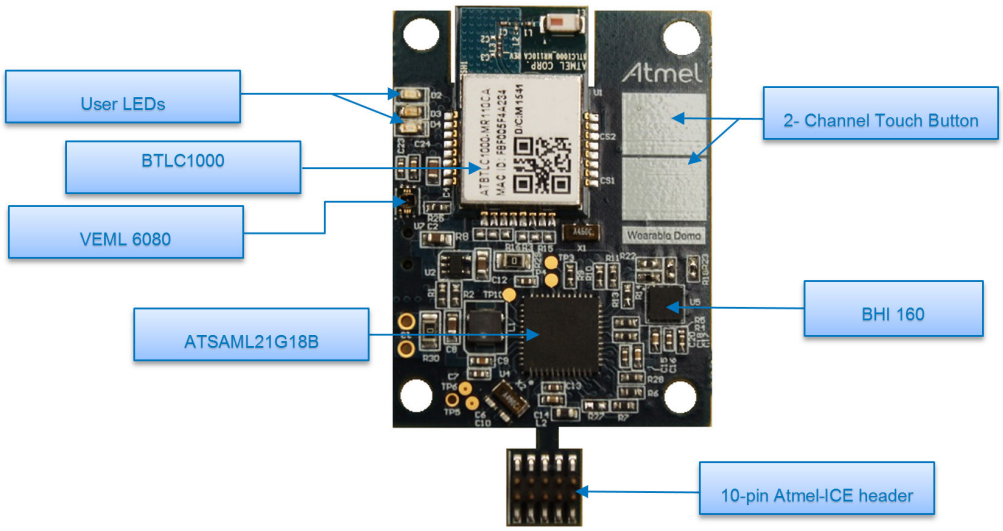
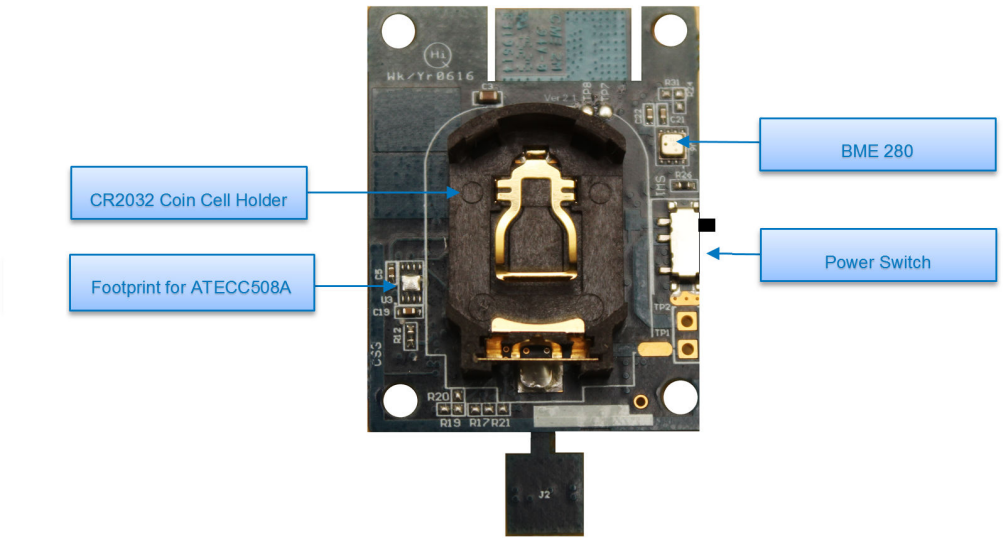


Figure 1-4. Bottom Side



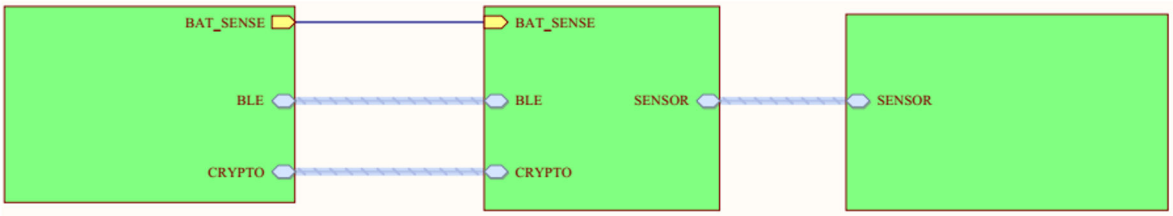
- Processor
  - SAML21G18B
- Sensors
  - Physical Sensors
    - Motion Sensors (6-axis motion BHI160)
      - Accelerometer
      - Gyro
    - Environmental Sensors (BME280)
      - Pressure
      - Humidity
      - Temperature
    - Light Sensor (VEML 6080)

        - Ambient Light
    - Virtual Sensors: The integrated Fuser Core of BHI160 receives raw sensor data from the connected sensors and provides virtual sensor data. Following virtual sensor data are supported in this Reference Design.
        - Game Rotation Vector
        - Step Detector
        - Gravity
        - Accelerometer
        - Gyroscope
- Crypto
    - ATECC508A
- Display
    - LED indicators for operational status
- Connectivity
    - ATBTLC1000 (an ultra-low power Bluetooth® SMART (BLE 4.1) System on a Chip)
- Power
    - CR2032 Coin Cell
- Programming Header
    - Atmel-ICE ARM 10-pin interface for programming
- CE/FCC certified
- Mechanical Dimension
    - 40mm x 30mm (excluding the programming header extension)

2. Getting Started

2.1. Quick Start

Figure 2-1. Functional Overview



The Atmel SMART SAM L21 MCU based on Cortex – M0+ and the Atmel SMART Bluetooth solution are the key components of the Wearable Demo platform. The ATBTLC1000 is an ultra-low power Bluetooth SMART System on a Chip with Integrated Cortex – M0 MCU, Transceiver, Modem, MAC, PA, TR Switch, and Power Management Unit (PMU). It can be used as a Bluetooth Low Energy link controller or data pump with external host MCU or as a standalone applications processor with embedded BLE connectivity and external memory.

The qualified Bluetooth Smart protocol stack is stored in dedicated ROM. The firmware includes L2CAP service layer protocols, Security Manager, Attribute protocol (ATT), Generic Attribute Profile (GATT) and the Generic Access Profile (GAP). Additionally, application profiles such as Proximity, Thermometer, Heart Rate, Blood Pressure, and many others are supported and included in the protocol stack. The ATBTLC1000 exchanges data with SAM L21 MCU through UART interface.

A BHI160 6-axis Smart Hub motion sensor and a BME280 environmental sensor from Bosch Sensortec, Vishay's VEML 6080 light/UV sensors form a network of Sensors proving periodic motion, environmental and light sense data to SAM L21 MCU through Two-Wire interface. The entire Wearable platform is powered by a simple coin cell. The Wearable Demo reference design is powered by CR2032.

2.2. Sensor Network

The organs of the Wearable Demo are its sensors. The BHI160 integrates a 6-axis IMU with the Bosch Sensortec Fuser core. It provides a flexible, low power solution for motion sensing and sensor data processing.

The BME280 is as combined digital humidity, pressure, and temperature sensor based on proven sensing principles.

The humidity sensor provides an extremely fast response time for fast context awareness applications and high overall accuracy over a wide temperature range. The pressure sensor is an absolute barometric pressure sensor with extremely high accuracy and resolution and drastically lower noise.

The integrated temperature sensor has been optimized for lowest noise and highest resolution. Its output is used for temperature compensation of the pressure and humidity sensors and can also be used for estimation of the ambient temperature. VEML6080 is an advanced ultraviolet (UV) and ambient light sensor. The whole sensor network is connected to SAM L21 through SERCOM I2C interface.

2.3. Design Documentation and Related Links

- SAM L21 datasheet: http://www.atmel.com/products/microcontrollers/arm/sam-l.aspx?tab=documents

- ATBTLC1000 fully certified module: http://www.atmel.com/devices/ATBTLC1000.aspx
- BHI160: https://www.bosch-sensortec.com/bst/products/all_products/bhi160
- BME280: https://www.bosch-sensortec.com/bst/products/all_products/bme280
- Wearable Demo Android App: https://play.google.com/store/apps/details?id=com.atmel.wearables
- Store: http://www.atmel.com/tools/ATULPC-DEMO.aspx

3. User Guide

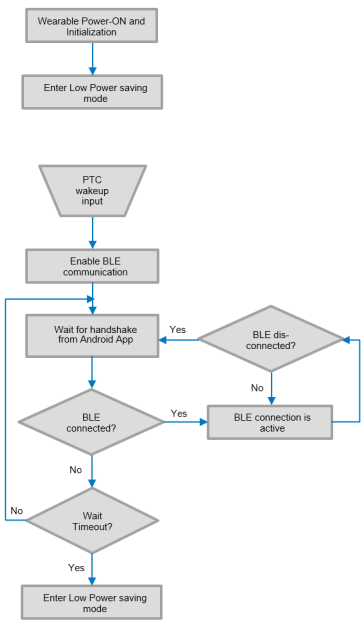
3.1. Kit Operation

The Wearable Demo is powered using a CR2032 coin cell. A switch controls the Power Supply to the entire system. After Power is ON, the Wearable goes through the initialization phase where the MCU's internal system, BTLC1000 and all the connected sensors are initialized. The end of the initialization phase is indicated by the ON to OFF transition of Power LED. After this phase, the user can enable BLE communication by "Touch and Hold" any one of the PTC button for about 1 second. When it is enabled, the BLE LED start to blink for 1sec OFF + 1 sec ON. At this time, the user can connect the Wearable from Wearable Android App using "Connect" button.

When the connection is established, the BLE LED start to blink at faster rate. Now the user can navigate to different Android App screens to check the sensor values, 2-D graphs and 3-D plots. For the list of Android app screens supported, refer to section Android Application Operation in this document. If no user input is received after the BLE is enabled or if the active session is disconnected from the Android app, the Wearable enters to Low Power mode thus saving the system power consumption.

Refer to the Functional Flow for the details.

Figure 3-1. Functional Flow



3.1.1. Status LED(s)

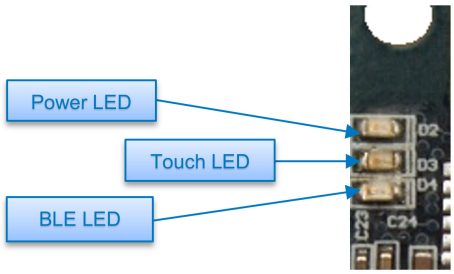
The Wearable Demo supports 3 user interface LED(s).

1) **Power LED:** The Power status LED blinks every 60 seconds. The reset status is ON to keep the user informed about the wearable initialization phase which approximately takes 15 to 16 seconds.

2) **Touch LED:** The Touch LED blinks when user swipe across the 2-channel touch surface is detected in either right or left direction. The reset status is OFF.

3) **BLE connection status LED:** The BLE status LED blinks at the rate of 50% duty cycle with period equal to 2sec when there is no active BLE connection. During active BLE connection, the LED is blinks at the rate of 980msec (OFF) + 20msec (ON). The reset status is OFF.

Figure 3-2. Status LEDs



3.1.2. PTC Buttons

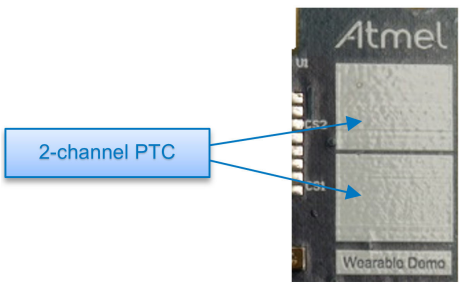
The Touch plays a major role for the user interface. The 2-channel PTC on the top side of the Wearable has three different functionalities.

1) **Enable BLE connection:** After the Wearable Power ON initialization, device is in low power mode. The user has to touch and hold anywhere in PTC buttons for about 1 second to enable BLE connection. Both touch buttons act as single button for waking up the device.

2) **Wakeup from Low power mode:** Touch and hold any one of the PTC button for 1 seconds to wake-up the Wearable from low power mode. Exiting from low power mode puts the BLE in advertising mode. If no connection is established within 60 seconds, the Wearable re-enters the low power mode for power saving.

3) **Swipe the Android App screen(s):** When the BLE connection is established with the Android phone and the app is active, swiping across the 2-channel PTC button from bottom to top or vice-versa equivalently swipe the app screen left to right or from right to left accordingly.

Figure 3-3. PTC Buttons



3.1.3. Bluetooth LE Operation

This design incorporates Atmel Bluetooth SMART (BLE) technology using ATBTLC1000 BluSDK version 4.0.

In this design, Wearable Demo acts as GAP Peripheral which can advertise (to let other devices know that it's there) and Mobile Application acts as GAP Central which scans for other devices and sends a connection request to establish a connection.

To exchange data between two connected devices, it uses GATT (Generic Attribute Profile) of BLE stack. It defines the way that two BLE devices transfer data back and forth using concepts called Services and Characteristics. GATT comes into play once a dedicated connection is established between two devices.

Services are used to break data up into logic entities, and contain specific chunks of data called characteristics. A characteristic is a value used in a service along with properties and configuration information about how the value is accessed. A characteristic definition contains a characteristic declaration, characteristic properties, and a value.

A service can have one or more characteristics, and each service distinguishes itself from other services by means of a unique numeric ID called a UUID, which can be either 16-bit (for standard BLE Services) or 128-bit (for custom services).

The Wearable Demo kit uses custom profile with 128 bit unique UUIDs. It uses base 128-bit UUID: F05A0000-3936-11E5-87A6-0002A5D5C51B. All services use 128-bit UUIDs, but for easy documentation reason the 16-bit part is listed in this document. It is embedded in the 128-bit UUID as shown in the below example.

Example: 0xBAD0 maps as F05ABAD0-3936-11E5-87A6-0002A5D5C51B. All UUIDs that are mapped to 128-bit values are marked *.

In this design, Wearable Demo acts as GATT Server which stores data locally and provides data access methods to a remote GATT client. Mobile Application acts as GATT client which accesses data on the remote GATT server via read, write or notify operations.

The custom profile uses following functions:

- Enable\disable sensor data from mobile application
- Configure sensor ODR(Output Data Rate) from mobile application
- Send data for enabled sensors at set output data rate to mobile application
- Send notifications for events like drop detection, low battery, step count, and touch gesture to mobile application

Table 3-1. Environment Service

Characterics	UUID	Properties	Data
Environment Data	BAD0 *	Read/Notify	(9 Bytes) Byte0 = Temp LSB Byte1 = Temp MSB Byte2 = Pressure LSB Byte3 = Pressure MSB Byte4 = UV LSB0 Byte5 = UV LSB1 Byte6 = UV MSB0 Byte7 = UV MSB1 Byte8 = Humidity
ODR	BAD1 *	Read/Write	1 Byte

When Environment Data Characteristics notification is enabled from application, the sensors (BME280 and VEML6080) starts to perform measurements at set ODR. The data is updated in the Environment Characteristics and notification is sent to application. This data is used to display environment data in mobile application. When Environment Data Characteristics notification is disabled from application, the sensor is put in stand-by mode.

Output Data Rate can be set by application. It uses ODR Characteristics. The following ODR settings are allowed for Environment sensors

- 1Hz

- 2Hz
- 4Hz
- 8Hz
- 10Hz

ODR settings can be configured using mobile application settings screen.

Table 3-2. Environment Service Protocol

User Action	From Wearable	From Android Phone
User enters to Environment Screen		Enable Environment Characteristics Notification
Environment Screen	Update Environment Characteristics with sensor data and send notification to application at set ODR	
When user moves out of Environment Screen		Disable Environment Characteristics Notification
User Opens settings screen		Read ODR Characteristics to get the current Output Data Rate for environment sensors
User sets new ODR value for environment sensors in Settings Screen		Write ODR Characteristics to set the new Output Data Rate for environment sensors

Table 3-3. Device Orientation Service

Characteristics	UUID	Properties	Data
Device Rotation Vector	BAD8 *	Read/Notify	(8 Bytes) Byte0 = X LSB Byte1 = X MSB Byte2 = Y LSB Byte3 = Y MSB Byte4 = Z LSB Byte5 = Z MSB Byte6 = W LSB Byte7 = W MSB
Gyro-Positions	BAD4 *	Read/Notify	(6 Bytes) Byte0 = X LSB Byte1 = X MSB Byte2 = Y LSB Byte3 = Y MSB Byte4 = Z LSB Byte5 = Z MSB
Accelero-Positions	BAD7 *	Read/Notify	(6 Bytes) Byte0 = X LSB Byte1 = X MSB Byte2 = Y LSB Byte3 = Y MSB Byte4 = Z LSB Byte5 = Z MSB
Drop Detection	BADA *	Notify	1 Byte
Step Increment	BADB *	Notify	1 Byte
ODR	BAD9 *	Read/Write	1 Byte

If even one of the Characteristics notification of this service is enabled from application, the sensor starts to perform measurements at set ODR. The rotation vector data is updated in the Device Rotation Vector Characteristics and the accelerometer position data is updated in the Accelerometer-Positions Characteristics.

After updating the data, Wearable Demo sends notification to application. Wearable Demo uses Game Rotation Vector (Quaternion+) data from BHI160 sensor for device orientation (3D image) plotting. Accelerometer data is used for 2D plotting graph in mobile application.

If Step Increment Characteristics notification is enabled by application, Wearable Demo sends Step Increment notification to application for each step detection. This data is used for Step Count Screen in mobile application.

If Drop Detection Characteristics notification is enabled by application, Wearable Demo sends Drop notification to application when it detects a device drop. This data is used for 'Wearable Drop Detected' popup in mobile application.

The BHI160 sensor is put in stand-by mode, when all Device Orientation Characteristics notifications are disabled from application. In other words, if the user navigates to environmental screen, BHI160 will be put in standby mode.

Output Data Rate can be set by application. It uses ODR Characteristics. The following ODR settings are allowed for Motion sensors (Accelerometer and Gyroscope sensors).

- 12.5Hz
- 25Hz
- 50Hz
- 100Hz
- 200Hz

Table 3-4. Device Orientation Service Protocol

User Action	From Wearable	From Android Phone
User enters to 3D Plot Screen		Enable Device Rotation Vector Characteristics Notification
3D Plot Screen	Update Device Rotation Vector Characteristics with Quaternion+ data and send notification to application at set ODR	
When user moves out of 3D Plot Screen		Disable Device Rotation Vector Characteristics Notification
User enters to Step Count Screeen and starts step count.		Enable Device Step Increment Characteristics Notification
Step Count Screen or any other screen	Send Step Increment Characteristics notification for each step detection	
Stops step count in Step Count Screen		Disable Device Step Increment Characteristics Notification
User enters to 2D Plot Screen (Accelerometer graph) and start the plot.		Enable Accelero-Positions Characteristics Notification
2D Plot screen	Update Accelero-Positions Characteristics with accelerometer data and send notification to app	

User Action	From Wearable	From Android Phone
When user moves out of 2D Plot Screen		Disable Accelero-Positions Characteristics Notification
User enters to 2D Plot Screen (Gyroscope graph) and start the plot.		Enable Gyro-Positions Characteristics Notification
2D Plot screen	Update Gyro-Positions Characteristics with Gyro data and send notification to app	
When user moves out of 2D Plot Screen		Disable Gyro-Positions Characteristics Notification
User Opens settings screen		Read ODR Characteristics to get the current Output Data Rate for motion sensors
User sets new ODR value for environment sensors in Settings Screen		Write ODR Characteristics to set the new Output Data Rate for motion sensors
User enables Drop Detection in Settings Screen		Enable Drop Detection Characteristics Notification
User drops device	Send Drop Detection Characteristics notification	

Table 3-5. Battery Service

Characteristics	UUID	Properties	Data
Low Battery	BADC *	Notify	1 Byte

This service is used to send low battery notification to mobile application. It has one characteristics Low Battery. Notification for this characteristics is enabled by the application once connection is established. When Wearable Demo detects low battery voltage, it sends notification to mobile application. Mobile application displays ‘Wearable Low Battery’ popup, when it receives low battery notification from Wearable Demo.

Table 3-6. Battery Service Protocol

User Action	From Wearable	From Android Phone
BLE connection established between mobile application and Wearable Demo		Enable Low Battery Characteristics Notification
Any Screen	Send Low Battery Characteristics notification when low battery voltage is detected.	

Table 3-7. Touch Service

Characteristics	UUID	Properties	Data
Touch Gesture	BADD *	Notify	1 Byte

This service is used to send left/right swipe notification to mobile application. It has one characteristics Touch Gesture. Notification for this characteristics is enabled by the application once connection is established. When Wearable Demo detects left/right swipe, it sends notification to mobile application. Mobile application navigates screen based on touch gesture received from Wearable Demo.

Table 3-8. Touch Service Protocol

User Action	From Wearable	From Android Phone
BLE connection established between mobile application and Wearable Demo		Enable Touch Gesture Characteristics Notification
Any Screen	Update Touch Gesture Characteristics with gesture data and send notification to app.	

3.1.4. Debug/Programming Interface

The Wearable Demo kit supports SWD debugging/programming interface through 10-pin Atmel-ICE ARM standard header. SAM-ICE can also be used with compatible 10-pin cable. Refer to Debugger pin assignments in the hardware schematic diagram.

Debug/Programmer: Atmel-ICE

IDE: Atmel Studio 7

ATBTLC1000: eFuse bits programmed to 4-wire mode

ATBTLC1000 has separate SWD interface which can be connected to SAM-ICE for eFUSE programming.

CAUTION: The eFuse bits on ATBTLC1000 module mounted on the Wearable Demo kit are pre-programmed before shipping. Re-programming the ATBTLC1000 module is not recommended as this will cause the Wearable Demo to stop functioning.

Figure 3-4. Atmel-ICE 10-pin Header Orientation



3.2. Android Application Operation

The Wearable Android App is supported on Android phones/tabs running Android Kitkat, Lollipop and Marshmallow with Bluetooth BLE support.

3.2.1. App Screens

3.2.1.1. Main Screen

The Main or Home Screen lists the available Wearable devices in the vicinity.

When this page launches, the app should automatically start scanning for available Wearable(s). The list should show all the available Wearable(s) within the range, by the device name, device address and signal strength (in dB). Next to the name of each Wearable(s), there is a button “CONNECT”.

The user should be able to select a Wearable in the list and connect by tapping on the “CONNECT” button. When connected, the app should automatically navigates to the proximity screen. If the Wearable kit is already connected to the App, then the Main Screen will list the connected Wearable with “DISCONNECT” button. When disconnect button is pressed, the App should again scan the available Wearable(s) in the vicinity.

The scan should be stopped as soon as the user press the “STOP SCAN” button. There should be a Navigation drawer button in the Main Screen. Pressing the Back button should exit from the application. There should be no action corresponding to a swipe to the right or to the left on the App screen or on the touch buttons on the Wearable.

Figure 3-5. Main Screen before Scanning

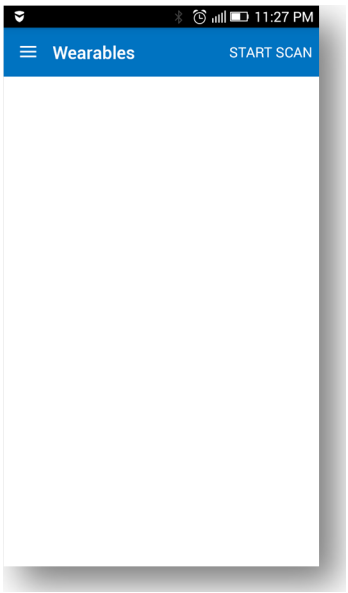


Figure 3-6. Main Screen while Scanning

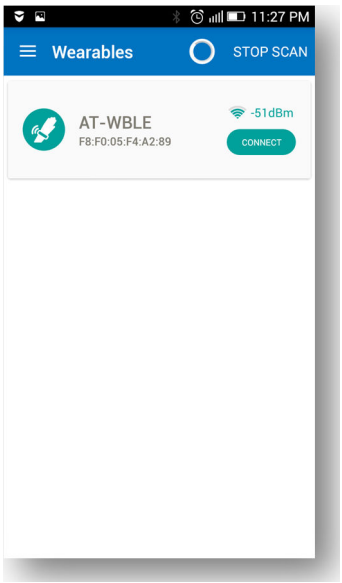


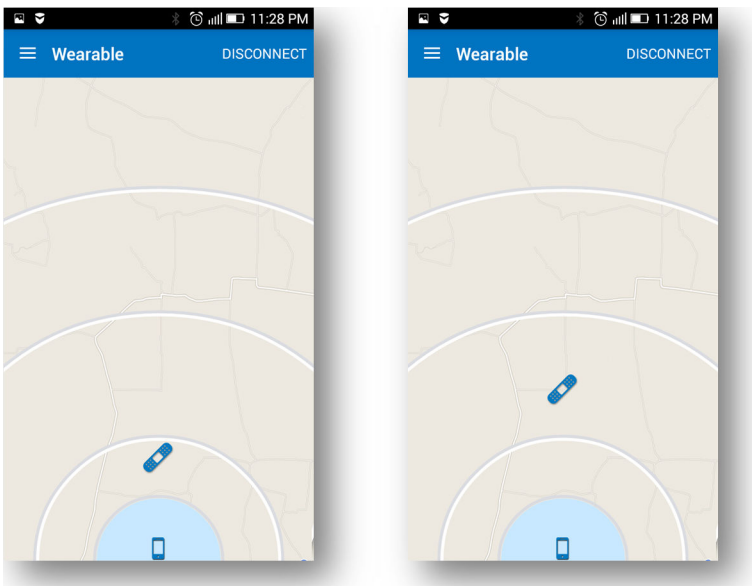
Figure 3-7. Connection In-progress



3.2.1.2. Proximity Screen

The page display the Status of the Bluetooth link and using RSSI, the approximate range between the Android Host and the Wearable can be located with a location icon. There is a Navigation Drawer button on the top left of the screen and a “DISCONNECT” button on the top right of the screen. When the user taps on this button, the Wearable gets disconnected from the app and displays the Main Screen.

Figure 3-8. RSSI plot



3.2.1.3. Environmental Sensor Screen

The Environment App screen includes the following parameters with a graph button against each of them:

- Temperature (deg C or F)
- Humidity (%RH)
- Pressure (mbar)
- Light (lx)

The user is re-directed to the corresponding graph when the user presses the Graph button. There is Navigation Drawer button on the top left of the screen and a “DISCONNECT” button on the top right of the screen. When the user taps on this button, the Wearable gets disconnected from the app and displays the Main Screen. The graph plot against each parameters has the ability to hold the last 5 minutes to 1 hour data.

Figure 3-9. Environmental Sensor Screen

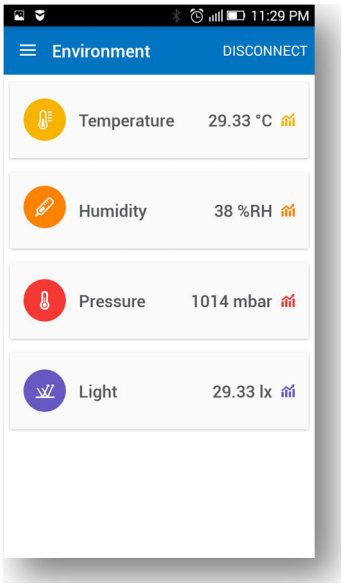


Figure 3-10. Temperature Plot

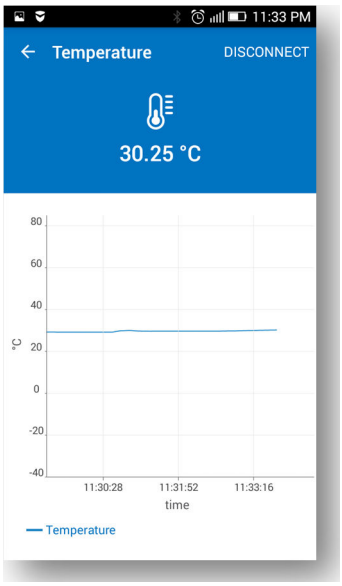


Figure 3-11. Humidity Plot

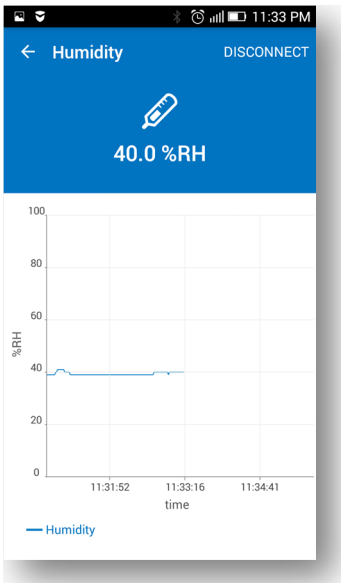


Figure 3-12. Pressure Plot

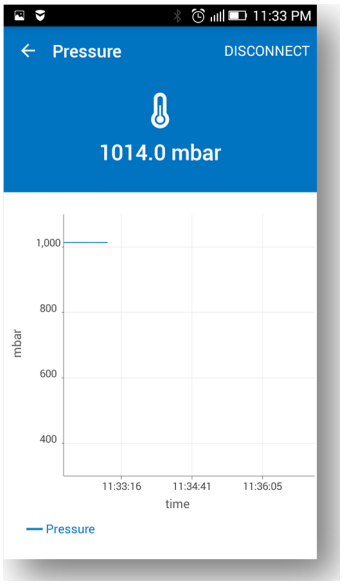
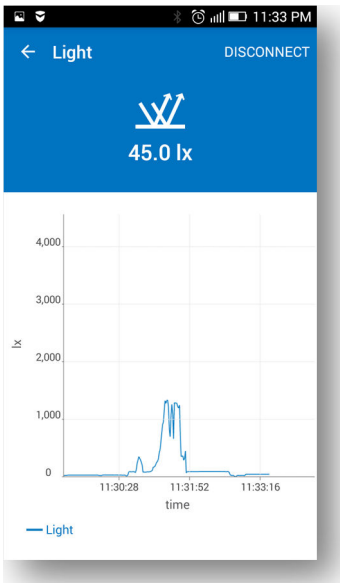


Figure 3-13. Light Plot

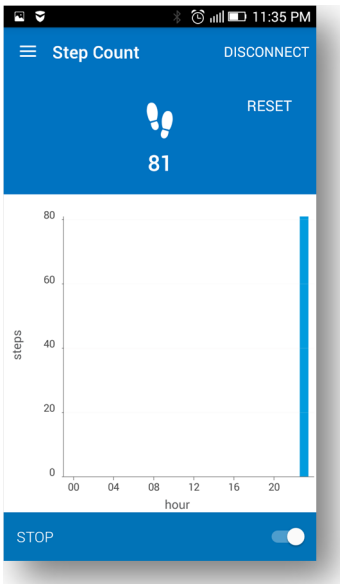


The user can slide the graph to the right or left as well as Zoom in or out. When the user zooms out the graph, the graph should show the data of the last 1 hour.

3.2.1.4. Step Counter

The Step Counter Plot is a 24 hour plot (12 A.M to 12 P.M) with one hour resolution points on the X-axis and step counts on the Y-axis. Y-axis is auto scalable. Y axis scale is auto-adjusted based on maximum step count for the available data. When the slider on the right bottom is flipped to ON state, Irrespective of screen, the counter increment for every step count is detected until the slider is flipped to OFF state. At the stop condition, the latest value of the step count is retained till the end of the plot time period. The latest value of the step count is shown on the top screen. When no step is detected, count will be taken as zero. When the “RESET” button is pressed, the value of the step count reset back to zero. The Step Count plot once started, irrespective of screen, the available step count data is plotted in the graph if the step count is detected. After every 24 hours, the plot resets itself.

Figure 3-14. Step Count Value and Plot



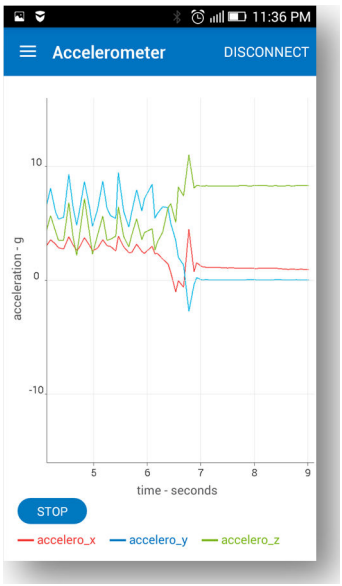
There is a Navigation Drawer button on the top left of the screen and a “DISCONNECT” button on the top right of the screen. When the user taps on this button, the Wearable gets disconnected from the app and displays the Main Screen. Step count graph history can be cleared from the Setting Screen. Swiping the screen to the left displays the Environment Screen. Swiping the screen to the right displays the Accelerometer Screen.

3.2.1.5. Motion Sense Screen

This screen and the next app screen shows the Accelerometer plot and the Gyroscope plot respectively The Accelerometer plot is a 2D plot of accelerometer against time from the data output from 6X sensor fusion algorithm. The 2D Plot of Accelerometer has time plot on X axis and acceleration (g) on the Y Axis.

The 2D Plot of Gyroscope has time plot on X axis and rotational speed (deg/sec) on the Y Axis. The user at any instance can “START” or “STOP” the plot using the button on the Left bottom screen.

Figure 3-15. Accelerometer Plot

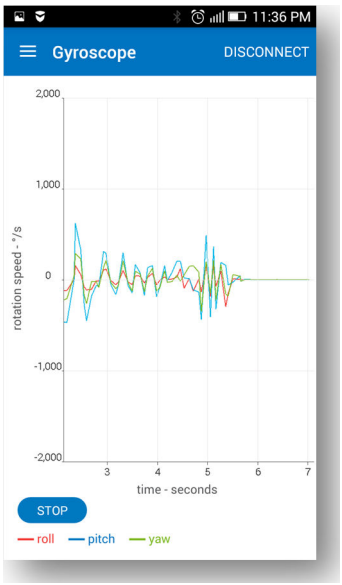


There is Navigation Drawer button on the top left of the screen and a “DISCONNECT” button on the top right of the screen. When the user taps on this button, the Wearable gets disconnected from the app and displays the Main Screen.

Swiping the screen to the left outside the plot take the user to the Step count Screen whereas, swiping the screen to the left from within the plot, allows the user to traverse along x-axis.

Swiping the screen to the right outside the plot take the user to the Gyroscope Screen whereas, swiping the screen to the right from within the plot, allows the user to traverse along x-axis.

Figure 3-16. Gyroscope Plot



There is Navigation Drawer button on the top left of the screen and a “DISCONNECT” button on the top right of the screen. When the user taps on this button, the Wearable gets disconnected from the app and displays the Main Screen.

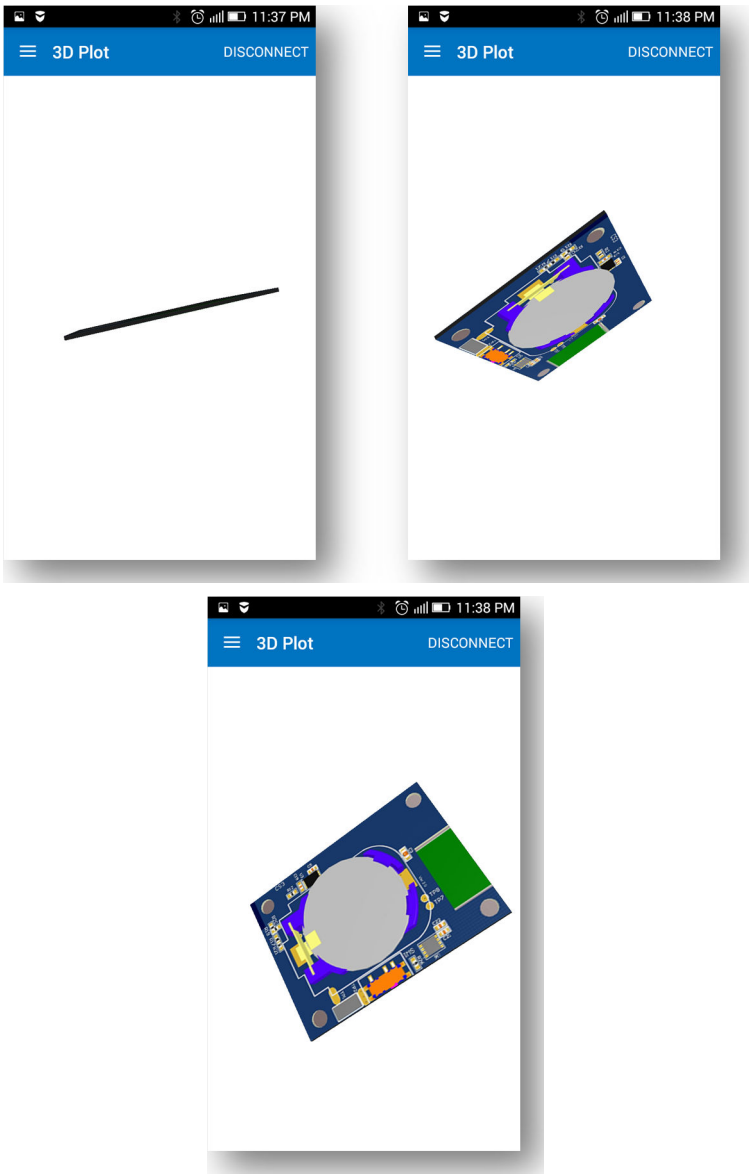
Swiping the screen to the left outside the plot take the user to the Accelerometer Screen whereas, swiping the screen to the left from within the plot, allows the user to traverse along x-axis.

Swiping the screen to the right outside the plot take the user to the 3-D plot Screen whereas, swiping the screen to the right from within the plot, allows the user to traverse along x-axis.

3.2.1.6. 3-D Plot

This screen presents the 3D plot of the Wearable, thanks to the Quaternion Game Rotation Vector Data from BHI160 Sensor Fusion Core. There should be Navigation Drawer button on the top left of the screen. There is Navigation Drawer button on the top left of the screen and a “DISCONNECT” button on the top right of the screen. When the user taps on this button, the Wearable gets disconnected from the app and displays the Main Screen.

Figure 3-17. 3D-Plots



Pressing the Back button displays the Main Screen. Swiping the screen to the left displays the Gyroscope Screen. Swiping the screen to the right has no action.

3.2.2. Alert Messages

The Wearable App displays alert messages, irrespective of the screen in which the user is currently at.

1) In-Case of Wearable out of Range, “Wearable Out of Range” alert message screen appears.

2) In-Case of Wearable being dropped on the floor, “Wearable Drop Detected” alert message screen appears.

3) “Wearable Low Battery” alert message appears, if the battery voltage of the Wearable coin cell is below threshold (~2.4V).

Among the three alert notifications, (3) has the highest priority in a scenario of simultaneous occurrence of all the three notifications. In case condition (3) happens, the alert message will be displayed and alarmed continuously until the Wearable is brought back to range and the Wearable re-connects. If the user wishes, he can only silence the alarm but not able to discard the notification but user can exit from

the application by pressing ‘EXIT’. If (2) and (3) occur simultaneously, then the alert messages alter among the two for a time period of 3 seconds each, until the user acknowledges the message by tapping the OK button on the message, however there is no corresponding acknowledgement action from the android app side. Pressing OK will exit the alert message.

Figure 3-18. Out of Range

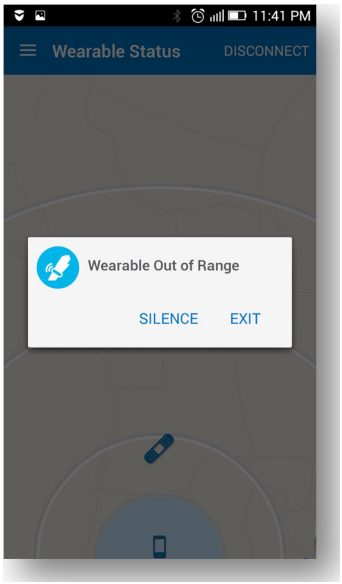


Figure 3-19. Drop Detection

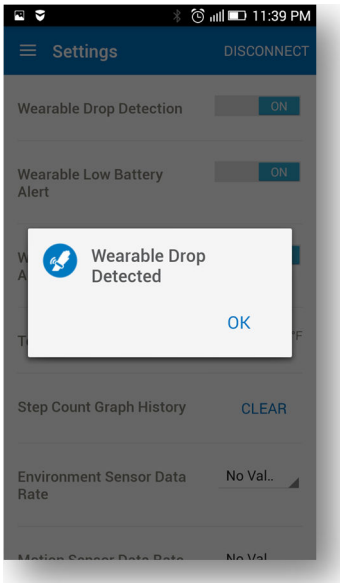
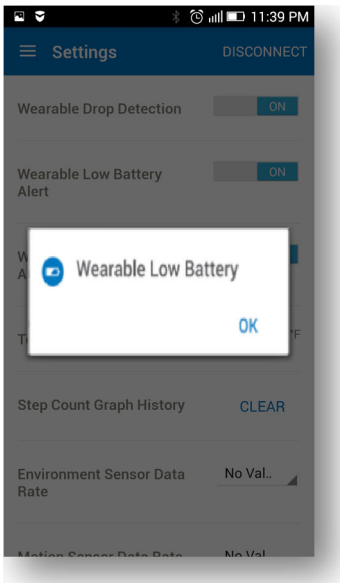


Figure 3-20. Low Battery



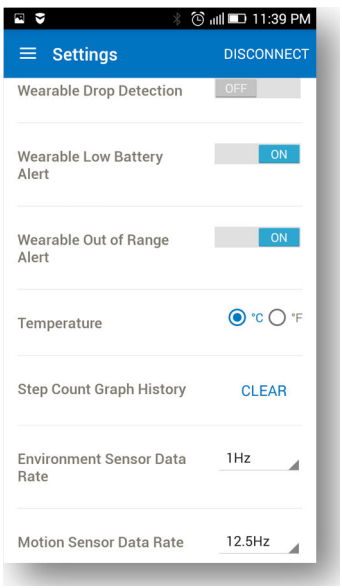
3.2.3. Settings Screen

In Settings menu, the user can manually turn on or off, the alert notifications and configure the ODR of sensors.

- Wearable Drop Detection
- Wearable Low Battery
- Wearable Out of Range
- Temperature unit selection (degree C or F)
- Option to clear Step Count Graph History
- Option to modify the Output Data Rate (ODR) for Environmental sensor
- Option to modify the Output Data Rate (ODR) for Motion sensor

There is a Navigation Drawer button on the top left of the screen.

Figure 3-21. Setting screen



3.3. Testing and Known Issues

The Wearable Demo kit and Android App has been tested on different Android OS versions running on different Android Phones/Tabs.

KitKat - Samsung galaxy tab, Lenovo A6000, Lenovo K3 Note, Redmi Note 2 prime

Lollipop - Nexus9, Lenovo A6000

Marshmallow - Nexus6, Lenovo K3 Note

3.3.1. Errata(s)

1) The “Out-Of-Range” alert goes off automatically and the sensor values on-screen are frozen to the last known values. There is no auto re-connection during this time even if BLE advertising is active. This issue is observed with Android One running KitKat 4.4.4 version. After around 30 seconds, the OS informs the App incorrectly that the connection has been re-established again.

3.4. Wearable Demo on the Public Domain

1) http://www.atmel.com/about/news/release.aspx?reference=tcm:26-79357

2) https://www.youtube.com/watch?v=blb4XynMWkc

4. Revision history

Doc. Rev	Date	Comments
42750A	08/2016	Initial document release

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Atmel Corporation 1600 Technology Drive, San Jose, CA 95110 USA **T:** (+1)(408) 441.0311 **F:** (+1)(408) 436.4200 | **www.atmel.com**

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